



# REVISTA BRASILEIRA DE ANESTESIOLOGIA

Official Publication of the Brazilian Society of Anesthesiology  
[www.sba.com.br](http://www.sba.com.br)



## CLINICAL INFORMATION

### Anesthesia for cesarean section in pregnant woman with Guillain Barré syndrome: a case report

Thiago Nobre Queiroz<sup>a,\*</sup>, Flora Margarida Barra Bisinotto<sup>b</sup>,  
Thaís Mara da Mota Silva<sup>c</sup>, Laura Bisinotto Martins<sup>d</sup>

<sup>a</sup> Programa de Residência Médica em Anestesiologia, Hospital das Clínicas, Universidade Federal do Triângulo Mineiro, Uberaba, MG, Brazil

<sup>b</sup> Universidade Federal do Triângulo Mineiro, Uberaba, MG, Brazil

<sup>c</sup> Programa de Residência Médica em Oftalmologia, Hospital das Clínicas da Universidade Federal de Uberlândia, Uberlândia, MG, Brazil

<sup>d</sup> Universidade de Ribeirão Preto, Ribeirão Preto, SP, Brazil

Received 11 July 2012; accepted 28 February 2013

Available online 12 February 2014

#### KEYWORDS

General anesthesia;  
Pregnancy;  
Diseases;  
Neuromuscular  
relaxant;  
Guillain Barré

#### Abstract

**Background and objectives:** Guillain Barré syndrome (GBS) is an autoimmune neurological disease characterized by an acute or subacute demyelinating polyradiculoneuritis. It is an unusual event during pregnancy and a challenge for the anesthesiologist, due to the possibility of impairment of neuromuscular function and occurrence of respiratory complications in the post-operative period. The objective of this paper is to discuss the anesthetic management of a pregnant patient affected by the disease.

**Case report:** Female patient, 30 years old, 38 weeks' pregnant, diagnosed with fetal death that occurred about a day, and with SGB. Cesarean section was performed under general anesthesia, progressing without complications perioperatively.

**Conclusions:** Although it is uncommon, GBS can affect pregnant women and the anesthesiologist may encounter such patients in his (her) daily practice. It is important to understand the peculiarities of GBS to adequately address the patient in the perioperative period, contributing to its better evolution.

© 2013 Sociedade Brasileira de Anestesiologia. Published by Elsevier Editora Ltda.

Este é um artigo Open Access sob a licença de [CC BY-NC-ND](http://creativecommons.org/licenses/by-nc-nd/4.0/)

#### PALAVRAS-CHAVE

Anestesia geral;  
Gestação;  
Doenças;

#### Anestesia para cesariana em gestante com síndrome de Guillain Barré: relato de caso

#### Resumo

**Justificativa e objetivos:** A síndrome de Guillain Barré (SGB) é uma doença neurológica autoimune que se caracteriza por uma polirradiculoneurite desmielinizante aguda ou subaguda.

\* Corresponding author.

E-mail: [thnobre@hotmail.com](mailto:thnobre@hotmail.com) (T.N. Queiroz).

Relaxante  
neuromuscular;  
Guillain Barré

É um evento incomum durante a gravidez e um desafio para o anesthesiologista pela possibilidade de comprometimento da função neuromuscular e de complicações respiratórias no pós-operatório. O objetivo deste trabalho é discutir o manejo anestésico da paciente gestante afetada pela doença.

*Relato de caso:* Paciente do sexo feminino com 30 anos, gestante de 38 semanas, com diagnóstico de óbito fetal havia um dia e SGB. Foi submetida à cesariana sob anestesia geral, evoluindo sem intercorrências no perioperatório.

*Conclusões:* Apesar de ser incomum, a SGB pode acometer gestantes e o anesthesiologista pode se deparar com esse tipo de paciente na sua prática diária. É importante compreender as peculiaridades da SGB para se abordar adequadamente a paciente no perioperatório, contribuindo para a sua melhor evolução.

© 2013 Sociedade Brasileira de Anestesiologia. Publicado por Elsevier Editora Ltda.

Este é um artigo Open Access sob a licença de [CC BY-NC-ND](#)

## Introduction

Patients with preexisting neurological diseases represent a challenge for the anesthesiologist, with respect to spinal blocks. Historically a more conservative approach is not to use the neuraxial blockade in these patients, because this practice could worsen the neurological condition.<sup>1</sup> The presence of a current pregnancy makes this a even greater challenge, because of concern about fetal well-being.

Anesthesia for patients with GBS is an uncommon event in anesthetic practice, still with some controversy in the literature. The objective of this report is to describe the anesthetic management of a pregnant patient with diagnosis of GBS who underwent a cesarean section. The anesthetic implications of SGB and the necessary considerations when choosing a particular anesthetic technique will be approached.

## Case report

Female patient, 30 years old, 83 kg, 170 cm tall, with 38 weeks of gestation, diagnosed with fetal death about a day and with Guillain Barré syndrome (GBS). She was admitted for emergency cesarean section for obstetric reasons. The patient reported acute flaccid tetraparesis picture that started 20 days ago, with worsening in the last four days. The beginning of tetraparesis was symmetrical in the lower limbs, progressing later to the upper limbs. She reported paresthesia of all four limbs, without sphincteric changes.

The previous history related anemia and urinary tract infection during the current pregnancy. Laboratory tests were not available and obstetric ultrasonography reported malformation and fetal death. The patient was admitted to the operating room with a hemodynamically stable picture, eupneic and with eight-hour-fast. On physical examination, flaccid tetraparesis, areflexia with distal predominance of lower limbs and absence of sensory level were observed. The monitorization consisted of cardioscope in DII and V5, pulse oximetry, noninvasive blood pressure, capnography and monitoring of neuromuscular transmission by acceleromyography (TOF Watch SX®) of adductor pollicis, with stimulation of the ulnar nerve by the train of four (TOF) stimulations every fifteen seconds.

The initial blood pressure was  $115 \times 75$  mmHg, sinus rhythm with a heart rate = 100 bpm and pulse oxygen saturation = 96%. Venoclysis was done with 18G catheter, continuing with the administration of metoclopramide 10 mg and ranitidine 50 mg 30 min before induction of anesthesia. After administration of 100% oxygen for three minutes via face mask, midazolam (3 mg) was administered and a continuous infusion of remifentanyl ( $0.5 \mu\text{g kg}^{-1} \text{min}^{-1}$ ) was initiated during three minutes, followed by lidocaine (80 mg), etomidate (20 mg) and rocuronium (80 mg).

In rapid sequence, tracheal intubation was uneventfully performed. Anesthesia was maintained with 2% sevoflurane and remifentanyl by continuous infusion ( $0.2 \mu\text{g kg}^{-1} \text{min}^{-1}$ ). The procedure lasted two hours. At that moment T2 in TOF was noted; neostigmine (3.0 mg) and atropine (1.5 mg) were administered. After 30 min, the patient was with good breathing pattern, T4/T1 ratio >90%, and with cooperative demeanor. The tracheal extubation was uneventful. The patient was taken to the post-anesthetic recovery room, where she remained under continuous monitoring. The next day, the patient was transferred to the intensive care unit.

## Discussion

In our case, general anesthesia was chosen for performing the cesarean section in a patient with GBS. As the fetus was not viable and the patient was in fasting for more than eight hours, general anesthesia was considered more beneficial versus spinal block.

Historically, it is considered prudent to avoid regional anesthesia in patients with preexisting neurological diseases. This conduct is based on the fact that these diseases may worsen; or a new deficit may develop perioperatively.<sup>1</sup> What is the importance of the existence of a neurological disease and of neuraxial anesthesia? The presence of a pre-existing clinical or subclinical neurological impairment may increase the risk for new lesions or worsen the existing ones during the perioperative period.

This syndrome, known as double-crush,<sup>2</sup> was first described in 1973 by Upton and McComas, and suggests that a nerve already compromised becomes more susceptible to injury in another place.<sup>1,2</sup> Thus, a previous neurological

disease would be considered as the first risk factor (first crush) and other aggression (second crush) would be related to anesthesia, due to mechanical trauma by the needle or catheter, ischemia caused by the vasoconstrictor agent, or chemical injury (neurotoxicity) produced by the local anesthetic itself.

Both diseases of the central nervous system, like multiple sclerosis and others, as well as diseases of the peripheral nervous system (hereditary or not), are susceptible to complications after regional anesthesia. GBS is an acquired autoimmune peripheral neuropathy, characterized by an acute or subacute demyelinating polyradiculoneuritis. GBS primarily affects peripheral nerves, but the proximal nerve roots and cranial nerves may also be compromised. Its etiology remains unknown.

Usually, GBS is preceded by infection, especially of upper respiratory pathways and gastrointestinal tract. Probably the mechanism involved is that of molecular mimicry. However, in some cases this association between prior infection and GBS is not evident or even reported. This syndrome is mainly characterized by a progressive ascending paralysis with areflexia and albuminocytologic dissociation on examination of cerebrospinal fluid. Weakness may be mild, for instance difficulty walking, or severe, such as quadriplegia and complete respiratory failure.<sup>3–5</sup>

GBS complicating pregnancy is a rare and of high-risk event. The annual incidence of GBS in the general population is 0.75–2 cases per 100,000 inhabitants.<sup>6</sup> Men are 1.5 times more affected than women.<sup>3</sup> The incidence increases with age<sup>3</sup> and appears to be lower in pregnant women, in whom the disease arises primarily in the three months after childbirth.<sup>7</sup> The end of pregnancy does not accelerate the recovery of the patient; rather, a worsening of symptoms occurs after delivery (both vaginal and surgical).<sup>7</sup> A favorable outcome in most cases is observed, with neonatal survival rate of 95.7%.<sup>8</sup> Despite the patient's neurological commitment, uterine contractions and cervical dilation are maintained, which makes possible the vaginal delivery.<sup>8</sup>

One should always keep in mind the possibility of autonomic dysfunction and of lower motor neuron lesion when doing anesthesia in a patient affected by GBS. The profound hypotension in response to simple position change, blood loss or positive airway pressure reflects the commitment of cardiovascular compensatory responses.<sup>9,10</sup> Moreover, nociceptive stimuli, such as laryngoscopy, can trigger an exaggerated increase in systemic blood pressure. Because of this unpredictable behavior, it would be wise a continuous monitoring of systemic blood pressure with intra-arterial catheter, especially in cases of surgical procedures more complex or that involve major blood loss.<sup>9,10</sup>

In this case, the option for anesthesia was based on reports of worsening of clinical picture after spinal anesthesia, and the nature of the case: a pregnancy with a dead fetus. General anesthesia was induced with rapid sequence technique, because of the risk of bronchoaspiration, both by SGB and by pregnancy. The use of succinylcholine in SGB is contraindicated, due to the risk of severe and potentially fatal hyperkalemia.<sup>9–13</sup>

There is an increase (upregulation) of extrajunctional muscle nicotinic receptors of acetylcholine<sup>11,14</sup> that, when depolarization occurs by the action of succinylcholine, lead to a large efflux of intracellular potassium to the plasma. It

is prudent not to use succinylcholine after 48–72 h of onset of SGB picture,<sup>12</sup> and its use should be avoided in patients with a recent history of the syndrome, because the return to normalcy may take weeks to years after the initial cause has ceased.<sup>12</sup> When necessary, nondepolarizing muscle relaxants can be used<sup>10</sup> and a careful monitoring of neuromuscular blockade should be instituted.

Ideally, before surgical procedures, patients should be investigated for pulmonary function,<sup>7</sup> because although asymptomatic, they may present significant impairment of lung function, which may be exacerbated postoperatively, and ventilatory support must always be available.<sup>9,10</sup>

There is no discussion, in patients undergoing Cesarean section, as to the benefits of spinal block, which is the technique of choice. General anesthesia is associated with increased maternal mortality, mainly due to failures in tracheal intubation, difficulty to ventilate and oxygenate and pulmonary aspiration of gastric contents. In SGB, the regional anesthesia can provide benefits, because of the great autonomic lability present.<sup>15</sup> However, there are reports of development of the syndrome and neurological worsening of symptoms after epidural anesthesia.<sup>7–9,16,17</sup>

Given that the SGB may have aggravated its course during the perioperative period,<sup>8,16</sup> it becomes difficult to assess these associations. There are also several cases of favorable outcomes after regional anesthesia<sup>8,18–20</sup> and there is no evidence that regional anesthesia can trigger the disease.<sup>16</sup> Therefore, GBS should not be considered an absolute contraindication to neuraxial anesthesia.<sup>8,9,18</sup> There is an increased sensitivity to local anesthetics, so the dose should be reduced and, wherever possible, fractionated, aiming to avoid lengthy blocks.<sup>15</sup>

General anesthesia, despite all caveats, is safe in patients with SGB<sup>9</sup> and should be preferred in cases with respiratory involvement.<sup>15</sup> Preference is given to anesthetics with fast metabolism and with little hemodynamic repercussion.

In this case, if the fetus was viable, regional anesthesia would be a more logical choice and the benefits would outweigh the risks.<sup>8</sup> The option by general anesthesia prevented the invasion of neuraxis, and fetal unfeasibility minimized the potential risks of the technique.

We conclude that, whatever the anesthetic technique chosen by the anesthesiologist, it should be discussed with the surgical team, the patient and her relatives,<sup>8,16,18,19</sup> to explain the risks associated with each type of procedure.

## Conflicts of interest

The authors declare no conflicts of interest.

## References

1. Jacob AK, Kopp SL. Regional anesthesia in the patient with preexisting neurologic disorders. *Adv Anesth*. 2011;29:1–18.
2. Upton ARM, McComas AJ. The double crush in nerve-entrapment syndromes. *Lancet*. 1973;302:359–62.

3. Hughes RAC, Cornblath DR. Guillain-Barré syndrome. *Lancet*. 2005;366:1653–66.
4. Richards KJC, Cohen AT. Guillain-Barré syndrome. *Br J Anaesth*. 2003;3:46–9.
5. Vedanarayanan VV, Chaudhry V. Guillain Barré syndrome – recent advances. *Indian J Pediatr*. 2000;67:635–46.
6. Ropper AH. The Guillain-Barré syndrome. *N Engl J Med*. 1992;326:1130–6.
7. Chestnut DH, Polley LS, Tsen LC, et al. Chestnut's obstetric anesthesia: principles and practice. 4th ed. Philadelphia: Elsevier; 2009. p. 1066.
8. Chan LYS, Tsui MHY, Leung TN. Guillain-Barré syndrome in pregnancy. *Acta Obstet Gynecol Scand*. 2004;83:319–25.
9. Miller RD, Eriksson LI, Fleisher LA, et al. Miller's anesthesia, vol. 1, 7th ed. Philadelphia: Churchill Livingstone; 2009. p. 1173.
10. Hines RL, Marschall KE. Stoelting's anesthesia and co-existing disease. 6th ed. Philadelphia: Elsevier Saunders; 2012. p. 269–70.
11. Tripathi SS, Hunter JM. Neuromuscular blocking drugs in the critically ill. *Contin Educ Anaesth Crit Care Pain*. 2006;6:119–23.
12. Martyn JAJ, Richtsfeld M. Succinylcholine-induced hyperkalemia in acquired pathologic states. *Anesthesiology*. 2006;104:158–69.
13. Feldman JM. Cardiac arrest after succinylcholine administration in a pregnant patient recovered from Guillain-Barré syndrome. *Anesthesiology*. 1990;72:942–4.
14. Naguib M, Flood P, McArdle JJ, et al. Advances in neurobiology of the neuromuscular junction: implications for the anesthesiologist. *Anesthesiology*. 2002;96:202–31.
15. Griffiths S, Durbridge JA. Anaesthetic implications of neurological disease in pregnancy. *Contin Educ Anaesth Crit Care Pain*. 2011;11:157–61.
16. Kocabas S, Karaman S, Firat V, et al. Anesthetic management of Guillain-Barré syndrome in pregnancy. *J Clin Anesth*. 2007;19:299–302.
17. Wiertelowski S, Magot A, Drapier S, et al. Worsening of neurologic symptoms after epidural anesthesia for labor in a Guillain-Barré patient. *Anesth Analg*. 2004;98:825–7.
18. Brooks H, Christian AS, May AE. Pregnancy, anaesthesia, and Guillain Barré syndrome. *Anaesthesia*. 2000;55:894–8.
19. Vassiliev DV, Nystrom EUM, Leicht CH. Combined spinal and epidural anesthesia for labor and cesarean delivery in a patient with Guillain-Barre syndrome. *Reg Anesth Pain Med*. 2001;26:174–6.
20. Alici HA, Cesur M, Erdem AF, et al. Repeated use of epidural anaesthesia for caesarean delivery in a patient with Guillain-Barré syndrome. *Int J Obstet Anesth*. 2005;14:269.